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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,138	12/15/2003	Jong Jin Park	021269-006	9250

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/734,138

Applicant(s)

PARK ET AL.

Examiner

Sin J. Lee

Art Unit

1752

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4-10 and 13-15 is/are allowed.
- 6) ☒ Claim(s) 1-3, 12 and 22 is/are rejected.
- 7) ☒ Claim(s) 23 and 24 is/are objected to.
- 8) ☒ Claim(s) 1-24 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-3,12 and 22 are rejected under 35 U.S.C. 102(a) as being anticipated by Lu et al (Chemical Abstract for "Micropatterns Constructed from Au Nanoparticles", Chemical Communications, (9), pg.1056-1057 (2003)).

Lu teaches a self-assembly film made of 4-mercaptophenol-capped Au nanoparticles and *dialzo* group containing polymers of nitro-diazo-resin (*the 4-mercaptophenol (HS-C₆H₄-OH) teaches present thiol compound of Formula 1 and teaches the present 4-hydroxythiophenol of claim 3*). The diazo group (a photosensitive group – see pg.6, lines 14-15 of present specification) of the polymers forms a H-

bonding with the –OH group of 4-mercatophenol-capped Au nanoparticles (see Scheme I). Then, Lu fabricates micropatterns from this self-assembly film by selective exposing it to UV light and developing with Na dodecyl sulfate aqueous solution, which clearly *means that Lu's self-assembly film is photosensitive*. Therefore, Lu teaches present inventions of claims 1-3 and 12: It is the Examiner's position that since the photosensitive diazo group was introduced to the 4-mercatophenol-capped Au nanoparticles through a H-bonding (which is still a reaction), the prior art's teaching meets the present limitation with respect to step (ii). Please note that the present claims 1 and 22 are product-by- process claims, and they do not require a photosensitive group in the photosensitive metal nanoparticle to be a polymerizable group.

Allowable Subject Matter

4. Claims 4-10 and 13-15 are allowed. Lu et al does not teach or suggest present photoinitiator of claim 4.
5. Claims 23 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Lu et al does not teach or suggest present reactive compound comprising a photosensitive group *and* a functional group (the functional group reacting with the terminal reactive group to the monolayer).

Response to Arguments

6. Applicants argue that Lu et al does not teach or suggest a metal nanoparticle formed by the present step (ii). However, as addressed above, since the photosensitive diazo group was introduced to Lu's 4-mercatophenol-capped Au nanoparticles through

a H-bonding (which is still a reaction), it is still the Examiner's position that the prior art's teaching meets the present limitation with respect to step (ii). Applicants also argue that in Lu, a pattern is formed from the difference in solubility between parts of the film that are covalently bonded vs. parts of the film with only hydrogen bonding, whereas in preset invention, a pattern is formed by irradiation which *polymerizes* the metal nanoparticle monomers. However, as addressed above, present claims do not require the photosensitive group in the photosensitive metal nanoparticle to be a polymerizable group.

For the reasons stated above, present rejections still stand.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

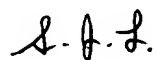
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic
Business Center (EBC) at 866-217-9197 (toll-free).



S. Lee
May 14, 2006



SIN LEE
PRIMARY EXAMINER